

DETAILED ACTION

1. This office action is responsive to application 10/521,258 filed on July 15, 2003.

Claims 1-12 are pending in the application and have been examined by the Examiner.

Information Disclosure Statement

2. The Information Disclosure Statements (IDS) mailed on August 25, 2005 and January 13, 2005 were received and have been considered by the Examiner.

3. The information disclosure statement filed August 25, 2005 fails to comply with 37 CFR 1.98(a)(2), **which requires a legible copy of each cited foreign patent document**; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information relating to JP 2001/188155 and JP 2002/118776 referred to therein has not been considered.

Priority

4. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

5. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet **within the range of 50 to 150 words**. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. **It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.**

6. The abstract of the disclosure is objected to because it contains the language, "The invention relates to," and contains more than 150 words. Correction is required.

See MPEP § 608.01(b).

Claim Objections

7. Claim 6 is objected to because of the following informalities: Lack of clarity and precision.

Claim 6, recites, "a second main surface which is oriented **perpendicularly to** the main surface." However, figure 1 clearly shows that the second main surface (124) is oriented in parallel with the main surface (109). Therefore, the Examiner will interpret

claim 6 to read, "a second main surface which is oriented **in parallel with** the main surface". Appropriate correction is required.

8. Claim 12 is objected to because of the following informalities: Lack of clarity and precision.

Claim 12, recites, in line 3, "the solid-state image sensor". However, no solid-state image sensor has previously been defined in the claim. Therefore, "**the** solid-state image sensor" should be amended to read, "**a** solid-state image sensor", or something of similar nature. Appropriate correction is required.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-6 and 8-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Takiar et al.(US 6,384,397).

Consider claim 1, Takiar et al. teaches:

A camera module (See figures 3, 4 and 5.) comprising a holder (housing assembly, 35) provided with a light-conducting channel (socket, 41), within which channel (41) a lens (optical lens, 31) having an optical axis is present (See figures 3

and 4, column 4, lines 26-33.), a solid-state image sensor (sensor package, 32) being present near an end of said light-conducting channel (See figures 3 and 4. An image sensor (32) is near a bottom end of the light conducting channel (41).), which image sensor (32) comprises an image pick-up section (optical detector portion, 34) oriented perpendicularly to the optical axis (See figures 3 and 4, column 3, lines 49-61.), characterized in that aligning means (mounting portion, 46) forming part of the holder (35, figures 3, 4 and 5) are present near the end of the light-conducting channel (See figures 3, 4 and 5. The aligning means (46) are present at the bottom end of the light conducting channel (41).), which aligning means (46) align the image pick-up section (34) with respect to the optical axis (See figures 3, 4 and 5, column 5, lines 14-34. The aligning means (46) position the image pick-up section (34) with respect to the lens (31).).

Consider claim 2, and as applied to claim 1 above, Takiar et al. further teaches that the image pick-up section (34) extends in a plane parallel to a main surface (sensor surface, 33) of the solid-state image sensor (see figures 3 and 4), in which the solid-state image sensor (32) comprises lateral surfaces oriented at least substantially perpendicularly to the main surface (See figures 3, 4, and 5. The image sensor (32) comprises lateral surfaces extending perpendicular to the main surface (33) and parallel with the optical axis.), and in which the holder (35) is at least substantially polygonal near the end (See figure 5. The holder (35) is rectangular at the end portion (46) thereof.), seen in cross-sectional view in a direction perpendicular to the optical axis

(Figure 5 is a cross-sectional view in a direction perpendicular to the optical axis.), in which the aligning means (46) comprise an extension of the holder (See figures 3, 4 and 5, column 5, lines 14-17. The base portion (40) of the holder (35) comprises the aligning means (46).), which extension (46) extends beyond the end of the light-conducting channel (41) and which has an inner surface that abuts against at least one of the lateral surfaces of the solid-state image sensor (See figures 3, 4 and 5. An inner surface of the extensions (46) abuts against the lateral surfaces of the image sensor (32).), as a result of which the solid-state image sensor (32) is contained within the holder (35) substantially without play in a direction perpendicular to the optical axis (See figures 3, 4, and 5, column 5, lines 14-18. The holder (35) is "fixedly" mounted to the imaged sensor (32).).

Consider claim 3, and as applied to claim 2 above, Takiar et al. further teaches that said polygon is a rectangle (See figure 5. The end (46) of the holder (35) is clearly a rectangle.).

Consider claim 4, and as applied to claim 3 above, Takiar et al. further teaches that said extension (46) abuts at least substantially against three of the lateral surfaces of the solid-state image sensor (See figures 3, 4 and 5. An inner surface of the extensions (46) abuts against the lateral surfaces of the image sensor (32). Takiar et al. further teaches in column 5, lines 6-9 that the base portion (40) of the holder (35)

comprises a single structure extending around the peripheral edge portion of the sensor surface (33, i.e. the base abuts against all lateral surfaces of the image sensor.).

Consider claim 5, and as applied to claim 4 above, Takiar et al. further teaches that the end of the light-conducting channel (41) is provided with an abutting surface oriented perpendicularly to the optical axis, against which the main surface (33) of the solid-state image sensor (32) abuts substantially without play, thereby determining the distance from the image pick-up section to the lens (See figures 3 and 4, column 5, lines 5-34. A portion of the interior wall (44) "fixedly" abuts the main image sensor surface (33).).

Consider claim 6, and as applied to claim 2 above, Takiar et al. further teaches that the camera module (See figure 4.) comprises a substrate (PCB substrate, 75), that the solid-state image sensor (32) is provided with a second main surface which is oriented in parallel with the main surface (See figures 3 and 4. A bottom surface (i.e. second surface) of the image sensor (32) is oriented in parallel with the main surface (33).), that the extension (46) has a second end which coincides at least substantially with the plane in which also the second main surface extends (See figures 3, 4 and 5. The extension (46) has a bottom end which lies in the same plane as the second main surface.), which second main surface and which second end abut against the substrate (See figure 4. The second end and second main surface abut against the substrate (75) through solder balls (60).).

Consider claim 8, and as applied to claim 2 above, Takiar et al. further teaches that the main surface (33) of the solid-state image sensor (32) extends outside the light-conducting channel (See figure 9. In an alternate embodiment, the image sensor (32) extends outside the light conducting channel (41).), with pads (sensor contacts, 76) being provided on the part of the main surface (33) outside the light-conducting channel (See figure 9. The pads (76) are outside the light-conducting channel (41).), which pads (76) function to provide electrical connections to electric circuits located outside the solid-state image sensor (See column 7, lines 8-17. A plurality of circuits terminate at terminals (78) coupled to pads (76).).

Consider claim 9, and as applied to claim 8 above, Takiar et al. further teaches in an alternate embodiment (figure 11) that an outer wall of the holder (35) is provided with at least one supporting wall, which extends parallel to the optical axis and which abuts against one of the lateral surfaces of the solid-state image sensor (32) insofar as it extends outside the light-conducting channel (See figure 11. The left wall of the holder (35) is provided with a supporting wall which extends parallel to the optical axis and abuts the left lateral surface of the image sensor (32). This left wall is outside the light-conducting channel (41), and even outside the connections to an external circuit (77).).

Consider claim 10, Takiar et al. teaches:

A holder (housing assembly, 35) for use in a camera module (See figures 3, 4 and 5.), which holder (35) is provided with a light-conducting channel (socket, 41), which is arranged for accommodating a lens (optical lens, 31) having an optical axis (A lens transmits and refracts light, and thus inherently has an optical axis.) and which is furthermore arranged for the placement of a solid-state image sensor (sensor package, 32) comprising an image pick-up section (optical detector portion, 34) near an end of the light-conducting channel (41, see figures 3 and 4), characterized in that aligning means (mounting portion, 46) forming part of the holder (35, figures 3, 4 and 5) are present near the end of said light-conducting channel (See figures 3, 4 and 5. The aligning means (46) are present at the bottom end of the light conducting channel (41).) for aligning the image pick-up section (34) with respect to the optical axis (See figures 3, 4 and 5, column 5, lines 14-34. The aligning means (46) position the image pick-up section (34) with respect to the lens (31).).

Consider claim 11, Takiar et al. teaches:

A camera system (See figures 3, 4 and 5.) comprising a camera module (See figures 3, 4 and 5.) with a holder (housing assembly, 35) provided with a light-conducting channel (socket, 41), in which channel (41) a lens (optical lens, 31) having an optical axis is present (See figures 3 and 4, column 4, lines 26-33.), in which a solid-state image sensor (sensor package, 32) provided with an image pick-up section (optical detector portion, 34) oriented perpendicularly to the optical axis (See figures 3 and 4, column 3, lines 49-61.) is present near an end of the light-conducting channel

(See figures 3 and 4. An image sensor (32) is near a bottom end of the light conducting channel (41).), and in which aligning means (mounting portion, 46) forming part of the holder (35, figures 3, 4 and 5) are present near said end of the light-conducting channel (41) for aligning the image pick-up section (34) with respect to the optical axis (See figures 3, 4 and 5, column 5, lines 14-34. The aligning means (46) position the image pick-up section (34) with respect to the lens (31).).

Consider claim 12, Takiar et al. teaches:

A method of manufacturing a camera module (figures 3, 4 and 5) comprising a holder (housing assembly, 35, see column 3, line 49 through column 5, line 34), characterized in that the holder (35) is provided with aligning means (mounting portion, 46), in which a solid-state image sensor (sensor package, 32) comes into contact with the aligning means (46) upon placement of the solid- state image sensor (32) in said holder (35), as a result of which an image pick-up section (optical detector portion, 34) present on the solid-state image sensor (32) is aligned with respect to an optical axis (See figures 3, 4 and 5, column 5, lines 14-34. The aligning means (46) position the image pick-up section (34) with respect to the lens (31).).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. Claims 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takiar et al. in view of Beaman et al.(US 5,821,532).

Consider claim 7, and as applied to claim 6 above, Takiar et al. does not explicitly teach that the holder (35) is provided with pins whose longitudinal axis extends parallel to the optical axis, which pins are fixed to the second end, with the pins being located in openings in the substrate, thereby aligning the camera module with respect to the substrate.

Beaman similarly teaches of an optics assembly (40, figure 4) containing a holder (housing, 24) and an image sensor (32, figure 3b, column 1, lines 19-22, column 3, lines 10-22).

However, Beaman additionally teaches that the holder (24) is provided with pins (pins, 22, figure 4) whose longitudinal axis extends parallel to the optical axis (See figure 4), which pins (22) are fixed to the second end (i.e. bottom end, figure 4), with the pins (22) being located in openings (apertures, 11, 12) in the substrate (substrate, 10),

thereby aligning the camera module with respect to the substrate (See column 3, lines 10-22. See figure 4. The pins (22) align the holder with respect to the substrate.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to provide pins as taught by Beaman on the bottom of the of the holder taught by Takiar et al. for the benefit of providing an inexpensive method to easily align the image module with the substate in which testing can be enabled at the earliest opportunity (Beaman, column 1, lines 43-46, column 2, lines 30-34).

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
15. Chen (US 2002/0097453) teaches a holder (32, figure 4) which contacts main and lateral portions of an image sensor (5).
16. Kuno et al. (US 7,009,654) teaches of a holder (4, 4b) which biases an image sensor (1, see figure 1).
17. Wataya et al. (US 6,693,674) and O'Regan et al. (US 5,359,190) teach pins contained on holders for aligning an image module with a substrate (see figure 4 of each reference).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALBERT H. CUTLER whose telephone number is (571)270-1460. The examiner can normally be reached on Mon-Thu (9:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan V Ho can be reached on (571)-272-7365. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AC

/Tuan V Ho/

Primary Examiner, Art Unit 2622